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Fecundity of Cod on the Flemish Cap

by

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INTRODUCTION

Estimates of the fecundity of cod have been shown to vary between various areas in the Northwest Atlantic. Pinhorn (1984) related such differences to the bottom water temperatures at the different spawning localities. An estimate of fecundity has been made here for cod of the Flemish Cap.

MATERIALS AND METHODS

Collections of ovaries with opaque eggs were made during January-February over the period 1979-85 from research vessel catches. After storage in Gilson's fluid for some weeks, the ovaries were washed through sieves to free the eggs from the ovarian tissue. Eggs were stored in alcohol. The eggs from each gonad were fractionated by means of the whirling vessel (Pitt, 1964). Two samples were counted from each gonad and the count was accepted if the samples did not differ by more than 5%.

Thirty-six estimates have been made for cod over the range 44-101 cm. Fresh gonad and liver volumes for each cod were observed at sea. One gonad volume observation was not made and one gonad volume (7 ml) appears to be rather small. Ages have been determined for all cod (Table 1).

RESULTS

The number of eggs was related to fork length and also to fresh gonad volume. Number of eggs varied from .12 million at length 46 cm to 2.64 million at length 101 cm. Fresh gonad volumes varied from 7 ml to 1400 ml with associated total egg estimates of .27 million and 2.64 million. The 7 ml volume appears to be low and may well be in error (Table 1).

Egg numbers ranged from .15 to .49 million at age 4 (3 specimens) and from 1.64 to 2.51 million at age 10 (2 specimens). Fresh liver volumes were quite variable. Regression parameters relating egg number with these variables are given in Table 2. Egg number is significantly related to each of length, age, gonad volume, and liver volume.

References

- Pinhorn, A. T. 1984. Temporal and spatial variation in fecundity of Atlantic cod (Gadus morhua) in Newfoundland waters. *J. Northw. Atl. Fish. Sci.*, 5(2): 161-170.
- Pitt, T. K. 1964. Fecundity of American plaice, Hippoglossoides platessoides (Fabr.), from Grand Bank and Newfoundland areas. *J. Fish. Res. Bd. Can.*, 21: 597-612.

SPECIAL SESSION ON RECRUITMENT

Table 1. Fecundity estimates of cod from the Flemish Cap.

Year	Length	Age	Gonad volume	Liver volume	Estimated number of eggs
1984	82	6	500	490	1180500
	88	7	500	700	1739000
	90	7	420	410	1148000
	81	6	400	430	1643000
	85	7	530	390	1164500
	63	4	7	180	271400
	79	6	480	450	1608000
	77	5	300	300	1293500
	89	7	760	610	1931000
	91	7	820	540	1654000
75	6	195	182	999500	
1983	96	10	1280	700	2513750
	74	6	330	270	819500
	94	10	1050	375	1643000
	57	4	48	105	152050
	101	10	1390	1020	2643000
1982	65	5	140	190	570250
	58	5	100	140	418700
	78	8	440	270	1799000
	66	4	110	135	492250
	86	7	-	400	1173000
1979	44	5	65	75	182700
	49	6	145	55	384800
	50	6	90	55	675750
	55	6	130	100	461750
	56	6	105	85	570000
	61	6	137	130	484500
	61	6	170	120	933000
	46	5	55	50	117700
	52	5	110	80	318250
	52	6	85	80	296125
	70	7	500	214	1193000
	66	6	210	155	796500
	69	6	225	100	880500
	45	5	155	40	173200
44	6	55	40	203450	

Table 2. Regression parameters relating egg number to length, age, gonad volume, and liver volume.

Parameter	Slope	Intercept	r	t	df	Type
length	3.0996	-5.8135	.9038	12.3156	34	logarithmic
	.0365	-1.5703	.9033	12.2762	34	arithmetic
gonad volume	.8194	-2.0773	.9096	12.3872	32	logarithmic
	.0018	.3445	.9047	12.0145	32	arithmetic
liver volume	.8180	-2.0037	.8629	9.9569	34	logarithmic
	.0026	.2534	.9038	12.3135	34	arithmetic
age	2.8010	-2.3404	.7385	6.3865	34	logarithmic
	.3702	-1.3446	.8103	8.0631	34	arithmetic